Appendix C: Glossary

This glossary provides definitions of terms used throughout the report and some others that are related to the field but not expressly mentioned.

Adequacy—Ability of the electric system to supply the aggregate electrical demand and energy requirements of customers at all times, taking into account scheduled and reasonably expected unscheduled outages of system elements.

Ancillary Services—Interconnected Operations Services identified by the U.S. Federal Energy Regulatory Commission (Order No. 888 issued April 24, 1996) as necessary to effect a transfer of electricity between purchasing and selling entities and which a transmission provider must include in an open-access transmission tariff. See also Interconnected Operations Services.

Apparent Power—Product of the volts and amperes. It comprises both real and reactive power, usually expressed in kilovolt-amperes (kVA) or megavolt-amperes (MVA).

Automatic Generation Control (AGC)—Equipment that automatically adjusts a control area's generation to maintain its interchange schedule plus its share of frequency regulation.

Availability—Measure of time that a generating unit, transmission line, or other facility is capable of providing service, whether or not it actually is in service. Typically, this measure is expressed as a percent available for the period under consideration.

Bulk Power System—The portion of an electric power system that encompasses the generation resources, system control, and high-voltage transmission system.

Capability—see Installed Capability and Operable Capability.

Capacity—The rated continuous load-carrying ability, expressed in megawatts (MW), megavolt-amperes (MVA), or megavolt-amperes-reactive (MVAR) of generation, transmission, or other electrical equipment.

Cascading—Uncontrolled successive loss of system elements triggered by an incident at any location. Cascading results in widespread service interruption, which cannot be restrained from sequentially spreading beyond an area predetermined by appropriate studies.

Clearing Price—see Energy Clearing Price.

Contingency—Unexpected failure or outage of a system component, such as a generator, transmission line, circuit breaker, switch, or other electrical element. A contingency also may include multiple components, which are related by situations leading to simultaneous component outages.

Contract Path—Specific contiguous electrical path from a point of receipt to a point of delivery for which transfer rights have been contracted.

Control Area—Electric system or systems, bounded by interconnection metering and telemetry, capable of controlling generation to maintain its interchange schedule with other control areas and contributing to frequency regulation of the interconnection.

Current Limiter—Device that, when added to an electric system, is designed to limit damaging levels of current in the system. In the Consolidated Edison distribution system, current limiters (in the form of fusible links) are used to protect low-voltage conductors in the underground distribution system.

Curtailment—Reduction in the scheduled capacity or energy delivery.

Demand Elasticity—Measure of how the quantity of a good (e.g., electricity) demanded responds to a change in its price.

Demand-Side Management—Programs that affect customer use of electricity, both the timing (sometimes referred to as load management) and the amount (sometimes referred to as energy efficiency).

Dispatch—Operating control of an integrated electric system involving operations such as assignment of levels of output to specific generating stations and other sources of supply; control of transmission lines, substations, and equipment; operation of principal interties and switching; and scheduling of energy transactions.

Distribution Network—A network of electrical lines from a substation (which is the terminus of the transmission network) to a series of transformers (and eventually to the ultimate customer).

Distribution System—Portion of an electric system that "transports" electricity from the bulk-power system to retail customers, consisting primarily of low-voltage lines and transformers.

Disturbance—Unplanned event that produces an abnormal system condition.

Electrical Energy—The generation or use of electric power by a device over a period of time, expressed in kilowatt-hour (kWh), megawatt-hour (MWh), or gigawatt-hour (GWh).

Electric System or Electric Power System—An interconnected combination of generation, transmission, and distribution components that make up an electric utility, an electric utility and one or more independent power producers (IPPs), or group of utilities and one or more IPPs.

Electric Utility—Corporation, person, agency, authority, or other legal entity or instrumentality that owns or operates facilities for the generation, transmission, distribution, or sale of electric energy primarily for use by the public and is defined as a utility under the statutes and rules by which it is regulated. An electric utility can be investor-owned, cooperatively owned, or government-owned (owned by a federal agency, crown corporation, state, provincial government, municipal government, and public power district).

Emergency—Any abnormal system condition that requires automatic or immediate manual action to prevent or limit loss of transmission facilities or generation supply that could adversely affect the reliability of the electric system.

Energy Clearing Price—The price at which the market is able to match the last unit of energy a specific seller is willing to sell with the last unit of energy a specific purchaser is willing to buy.

Federal Energy Regulatory Commission (FERC)—Independent federal agency within the U.S. Department of Energy that, among other responsibilities, regulates the transmission and wholesale sales of electricity in interstate commerce.

Firm Power or Purchase—Power or power-producing capacity intended to be available at all times during the period covered by a guaranteed commitment to deliver, even under adverse conditions.

Forced Outage—Removal from service availability of a generating unit, transmission line, or other facility for emergency reasons or a condition in which the equipment is unavailable because of unanticipated failure.

Frequency—Rate, in cycles per second (or Hertz, Hz), at which voltage and current oscillate in electric power systems. The reference frequency in North American Interconnections is 60 Hz.

Generating Reserve—see Reserve.

Generating Unit—An electric generator together with its prime mover (e.g., steam from boiler).

Grid—System of interconnected power lines and generators that is managed so that the generators are dispatched as needed to meet the requirements of the customers connected to the grid at various points. Gridco is sometimes used to identify an independent company responsible for the operation of the grid.

Independent System Operator (ISO)—A neutral operator responsible for maintaining the generation-load balance of the system in real time. The ISO performs its function by monitoring and controlling the transmission system and some generating units to ensure that generation matches loads.

Installed Capability—Seasonal (i.e., winter and summer) maximum load-carrying ability of a generating unit, excluding capacity required for station use.

Interconnected Operations Services (IOS)—Services that transmission providers may offer voluntarily to a transmission customer under Federal Energy Regulatory Commission Order No. 888 in addition to ancillary services.

Interconnection—When capitalized, any one of the major electric system networks in North America. When not capitalized, the facilities that connect two systems or control areas. In addition, an interconnection refers to the facilities that connect a nonutility generator to a control area or system.

Interface—Specific set of transmission elements between two areas or between two areas that make up one or more electric systems.

Interruptible Rate—Electricity rate that, in accordance with contractual arrangements, allows interruption of consumer load by direct control of the utility system operator or by action of the consumer at the direct request of the system operator. It usually involves commercial and industrial consumers. In some instances, the load reduction may be affected by direct action of the system operator (remote tripping) after notice to the consumer in accordance with contractual provisions.

Load—A consumer of electric energy; also the amount of power (sometimes called demand) consumed by a utility system, individual customer, or electrical device.

Load Pocket—Geographical area in which electricity demand sometimes exceeds local generation capability and in which there is an electricity import limitation as a result of transmission constraints.

Load Shedding—The process of deliberately removing (either manually or automatically) preselected customer demand from a power system in response to an abnormal condition in order to maintain the integrity of the system and minimize overall customer outages.

Market Clearing Price of Electricity—see Energy Clearing Price.

Marketers—Commercial entities that buy and sell electricity.

Must-Run Resources—Generation designated to operate at a specific level and not available for dispatch.

Network Distribution—Method of distributing electric power to a densely populated area, where a network or grid of low-voltage conductors covers an area of several city blocks to a few square miles. The grid is solidly connected and is fed from multiple distribution feeders.

Nonfirm Power or Purchase—Power or power-producing capacity supplied or available under a commitment having limited or no assured availability.

Nonspinning Reserve—Generation capacity that is not being utilized but that can be activated and used to provide assistance with little notification.

North American Electric Reliability Council (NERC)—A not-for-profit company formed by the electric utility industry in 1968 to promote the reliability of the electricity supply in North America. NERC consists of 10 Regional Reliability Councils and one Affiliate whose members account for virtually all the electricity supplied in the United States, Canada, and a portion of Baja California Norte, Mexico. The members of these Councils are from all segments of the electricity supply industry—investor-owned, federal, rural electric cooperative, state/municipal, and provincial utilities, independent power producers, and power marketers. The 10 NERC Regional Reliability Councils are East Central Area Reliability Coordination Agreement (ECAR), Electric Reliability Council of Texas (ERCOT), Florida Reliability Coordinating Council (FRCC), Mid-Atlantic Area Council (MAAC), Mid-America Interconnected Network (MAIN), Mid-Continent Area Power Pool (MAPP), Northeast Power Coordinating Council (NPCC), Southeastern Electric Reliability Council (SERC), Southwest Power Pool (SPP), and Western Systems Coordinating Council (WSCC). The Affiliate is the Alaskan Systems Coordination Council (ASCC).

Open-Access Same-Time Information System (OASIS)—An electronic posting system for transmission access data that allows all transmission customers to view the data simultaneously.

Operable Capability—The portion of installed capability of a generating unit that is in operation or available to operate in the hour.

Operating Reserve—That capability above firm system demand required to provide for regulation, load forecasting error, equipment forced and scheduled outages, and local area protection. It includes both spinning and nonspinning reserve.

Peak Demand or Load—The greatest demand that occurs during a specified period of time.

Power Pool—Entity established to coordinate short-term operations to maintain system stability and achieve least-cost dispatch. The dispatch provides backup supplies, short-term excess sales, reactive power support, and spinning reserve. Historically, some of these services were provided on an unpriced basis as part of the power pool members' utility franchise obligations. Coordinating short-term operations includes the aggregation and firming of power from various generators, arranging exchanges between generators, and establishing (or enforcing) the rules of conduct for wholesale transactions. The pool may own, manage, and/or operate the transmission lines (i.e., wires) or be an independent entity that manages the transactions between entities. Often, the power pool is not meant to provide transmission access and pricing or to provide settlement mechanisms if differences between contracted volumes among buyers and sellers exist.

Reactive Power—Portion of electricity that establishes and sustains the electric and magnetic fields of alternating-current equipment. Reactive power must be supplied to most types of magnetic equipment, such as motors and transformers. It also must supply the reactive losses on transmission facilities. Reactive power is provided by generators, synchronous condensers, or electrostatic equipment such as capacitors and directly influences electric system voltage. It is usually expressed in kilovars (kVAR) or megavars (MVAR).

Real Power—Rate of producing, transferring, or using electrical energy, usually expressed in kilowatts (kW) or megawatts (MW).

Reliability—Degree of performance of the elements of the bulk power system that results in electricity being delivered to customers within accepted standards and in the amount desired. Reliability may be measured by the frequency, duration, and magnitude of adverse effects on the electric supply. Electric system reliability can be addressed by considering two basic and functional aspects of the electric system—adequacy and security.

Reserve—Electric power generating capacity in excess of the system load projected for a given time period. It consists of two sources: spinning reserve and supplemental reserve.

Retail Sales—With regard to the electric industry, electrical energy supplied for residential, commercial, and industrial end-use purposes. Other small end-use classes, such as agriculture and street lighting, also are included.

Schedule—Agreed-upon transaction size (megawatts), start and end time, beginning and ending ramp times and rate, and type required for delivery and receipt of power and energy between the contracting parties and the control area(s) involved in the transaction.

Security—Ability of the electric system to withstand sudden disturbances, such as electric short circuits or unanticipated loss of system elements.

Security Coordinator—One of 23 entities established by NERC with the responsibility and authority to direct actions aimed at maintaining real-time security for a control area, group of control areas, NERC subregion, or NERC region.

Short-Notice or Short-Term Transaction—Transaction for the transfer of net energy from one region to another, made with little time between the transaction and the transfer (typically, less than one hour).

Spinning Reserve—Ancillary service that provides additional capacity from electricity generators that are on line, loaded to less than their maximum output, and available to serve customer demand immediately should a contingency occur.

Stability—Ability of an electric system to maintain a state of equilibrium during normal and abnormal system conditions or disturbances.

Supplemental Reserve—Ancillary service that provides additional capacity from electricity generators that can be used to respond to a contingency within a short period, usually 10 minutes.

System—see Electric System.

System Operator—Individual at an electric system control center whose responsibility it is to monitor and control that electric system in real time.

Tariff—Schedule detailing the terms, conditions, and rate information applicable to various types of electric service.

Topology—Structure and layout of a system.

Transmission—Interconnected group of lines and associated equipment for the movement or transfer of electric energy between points of supply and points at which it is transformed for delivery to customers or is delivered to other electric systems.

Unit—see Generating Unit.

Unit Commitment—Process of determining which generators should be operated each day to meet the daily demand of the system.

Utility—see Electric Utility.

Volt-Ampere-Reactive (VAR)—Unit of measure of the power that maintains the constantly varying electric and magnetic fields associated with alternating-current circuits. See Reactive Power.

Voltage—The unit of measure of electric potential.

Voltage Collapse—An event that occurs when an electric system does not have adequate reactive support to maintain voltage stability. Voltage collapse may result in outage of system elements and may include interruption in service to customers.

Wholesale Electricity Market—Purchase and sale of power, according to agreements with varying lengths and lead times, among power marketers, power producers, and other wholesale entities.